

**To:** Ridley, William[jiridley@usgs.gov]  
**Cc:** Horton, Robert[rhorton@usgs.gov]; Laura Bexfield[bexfield@usgs.gov]; Allison Shipp[aashipp@usgs.gov]; Andrew Todd[atodd@usgs.gov]; Brent Lewis[Brent\_Lewis@blm.gov]; Breton Bruce[bbruce@usgs.gov]; Cory Angerth[angerth@usgs.gov]; D Kirk Nordstrom[dkn@usgs.gov]; David L Fey[dfey@usgs.gov]; David Lytle[dlytle@usgs.gov]; David Mau[dpmu@usgs.gov]; David Reppert[dreppert@usgs.gov]; David Susong[ddsusong@usgs.gov]; Geoffrey S Plumlee[gplumlee@usgs.gov]; Heidi K Koontz[hkoontz@usgs.gov]; Holly Weyers[hsweyers@usgs.gov]; James M Leenhouts[leenhout@usgs.gov]; Jean M Morrison[jmorrison@usgs.gov]; Jerad Bales[jdbales@usgs.gov]; Card, Joan[Card.Joan@epa.gov]; JoAnn M Holloway[jholloway@usgs.gov]; Katie Walton-Day[kwaltond@usgs.gov]; Kent Becher[kdbecher@usgs.gov]; Matt Ely[mely@usgs.gov]; Michael Lewis[mlewis@usgs.gov]; Peter Griffiths[pgriffiths@usgs.gov]; rich wanty[rwenty@usgs.gov]; Robert J Hart[bhart@usgs.gov]; Robert Kimbrough[rakimbro@usgs.gov]; Robert Runkel[runkel@usgs.gov]; Scott Vanderkooi[svanderkooi@usgs.gov]; Suzanne Paschke[spaschke@usgs.gov]; Thomas Chapin[tchapin@usgs.gov]; Timothy Raines[thraines@usgs.gov]; Todd[thoefen@usgs.gov]; Trude King[tking@usgs.gov]; Vineetha Kartha[vkartha@azwater.gov]; Lee Allison[lee.allison@azgs.az.gov]; Max Ethridge[methridge@usgs.gov]  
**From:** Yager, Douglas  
**Sent:** Sat 8/15/2015 6:03:36 PM  
**Subject:** Re: Animas update 8-14-15

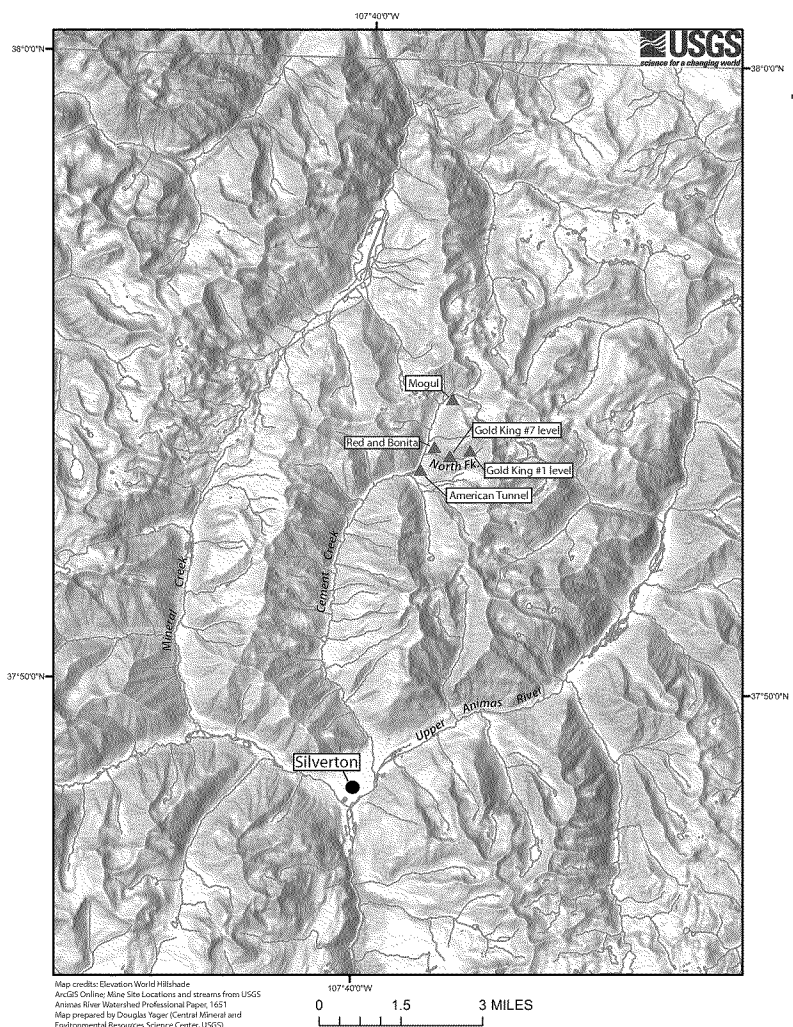
Hello All,  
I have attached (via google drive) a revised map with mines of interest. In my previous email I mentioned that the Gold King mine has multiple levels. I have added the Gold King # 7 level to this map based on coordinates that are on page 284, Animas River Watershed USGS Professional Paper 1651, Chapter E5, Mine Inventory and Compilation of Mine-Adit Chemistry Data by Church and others.

Please delete the map that I sent yesterday so as not to confuse it with this revised version. I can also send this in .pdf format.

Best regards,

Doug

*Douglas Yager  
Central Mineral and Environmental Resources Science Center  
USGS, Denver Federal Center,  
Box 25046, MS 973  
Denver, CO 80225  
303-236-2487  
[dyager@usgs.gov](mailto:dyager@usgs.gov)*



MineSiteMap.png

On Fri, Aug 14, 2015 at 2:46 PM, Yager, Douglas <[dyager@usgs.gov](mailto:dyager@usgs.gov)> wrote:

Hello All,

Geoff Plumlee asked that I prepare a map that shows the mine site locations that we have been discussing. All locations are from the Animas River Watershed Professional paper 1651 GIS database. I used a hillshaded relief image for the base map.

Please note that the Gold King mine has multiple levels (I plotted the #1 level. There are several other levels in the database that are in close proximity to the one I plotted. I also included the Mogul mine, due to Katie and Dana Bove's work on the fluoride as a natural

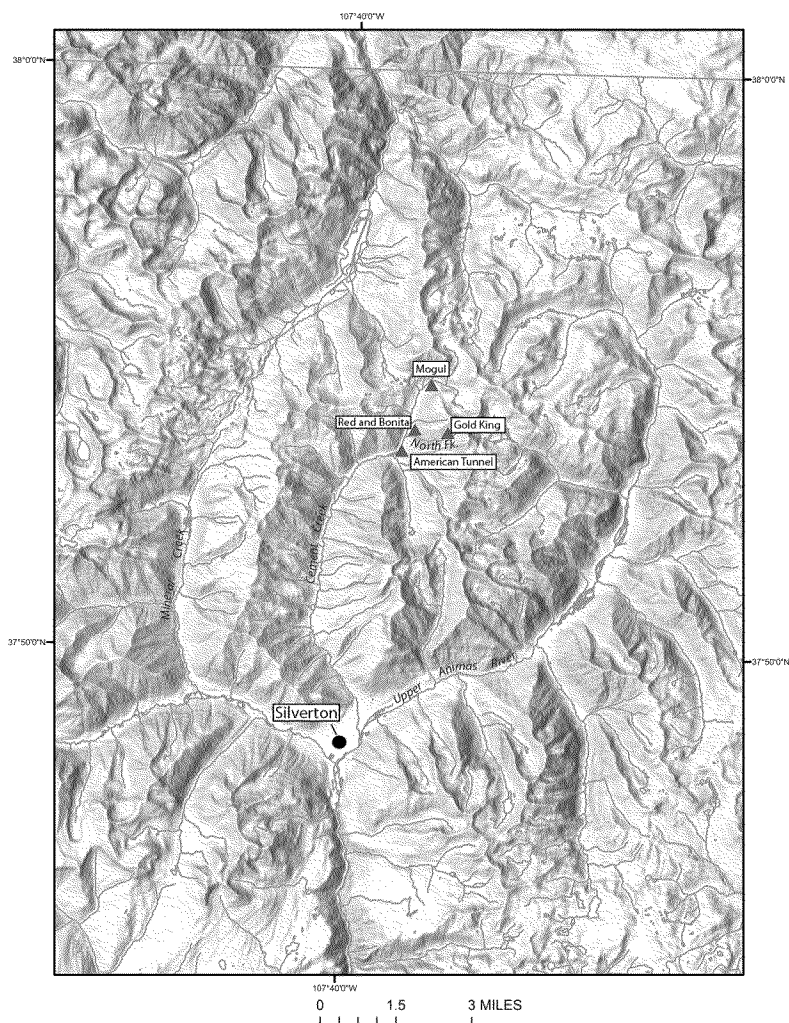
tracer story that I mentioned in a previous email. FYI, the American Tunnel is named in the database as "American Tunnel Level of Sunnyside Mine (Gold King Mill Level Tunnel).

As an aside for those unfamiliar but interested in the geology, the arcuate drainages of the Upper Animas River and Mineral Creek that are shown well on the map define the margins of the 27.6 Ma Silverton caldera. The Silverton caldera is nested within the margins of an older, 28.2 Ma super volcano (San Juan caldera). Mineralization events including at the Gold King did not form until about 22 Ma.

Best regards,

Doug

*Douglas Yager*  
*Central Mineral and Environmental Resources Science Center*  
*USGS, Denver Federal Center,*  
*Box 25046, MS 973*  
*Denver, CO 80225*  
*303-236-2487*  
[dyager@usgs.gov](mailto:dyager@usgs.gov)



On Thu, Aug 13, 2015 at 9:09 PM, Ridley, William <[iridley@usgs.gov](mailto:iridley@usgs.gov)> wrote:

I listened to the owner of Gold King Mine on KOA radio this evening. As an aside, he owns the mine for potential of tellurium production, presumably from mill tailings or waste. Seemed to be a reasonable guy. He indicated that the water currently discharged at the Gold King Mine was very high in base metals whereas the mineralization at Gold King was almost devoid of base metals. This contrasted with the high base metal content of water generated at the Sunnyside Mine. According to him, the big problem is the Sunnyside Mine that has over 100 miles of underground working that are currently flooded and discharging water into the surrounding smaller mines. Of course, deflecting blame is part of the game even though EPA has said "my bad".

On Thursday, August 13, 2015, Horton, Robert <[rhorton@usgs.gov](mailto:rhorton@usgs.gov)> wrote:

All, here is an update on the Animas mine spill activities since yesterday. Note, if you are on this email list and don't want to be, let me know.

Spoke with Brent Lewis, BLM Colorado AML lead. No technical news to report. Lots of "politicking" going on.

Horton fielded an info request from Navajo Nation.

A number of agencies (USBR, NPS, EPA) are asking about our sampling protocol/schedule. Once USGS protocol is decided (centers collaborating, see KWD for info) that protocol will be distributed.

Had an Animas meeting call at 2:00, here are highlites from my notes:

Asked all centers to brief on their data collecting activities.

Thomas Chapin (CGGSC) returned from Silverton/Durango and gave us a verbal briefing. Gold King still discharging at about 200 gpm. Discharge captured in treatment ponds. His sample deployment went well. Thomas brought back some of Runkel's samples for analysis. Thomas pointed out the EPA staff were working hard and could use our help 1. in the field and 2. getting the scientific word out about the impact of the spill.

Rob Runkel (CWSC) is still in the field collecting samples.

NMWSC gave a briefing of their filed efforts. Have samples and are collecting more data. Some samples have arrived in Boulder and are awaiting analysis schedule.

Jean Morrison (CGGSC) has a Farmington sample in the queue.

UTWSC briefs on sampling effort, sediment trap samples. UT State agencies sampling, not able to define plume.

Doug Yager (CMR) stressed the benefit of long term sampling and keeping engaged with local partners.

Heidi Koontz (PA) still working on USGS "Top Story". Wants to get it on the web soon before the story goes cold. Things are just about ready, but needs an updated USGS AML publication list.

Some brief discussion/concern about uranium in the water. Doug Yager pulled historical data and only found 2 samples above MCL in the data base.

Some discussion about making our historic data more relatively available. Mike Lewis suggested posting links to data and reports on ScienceBase.

Had a fair amount of discussion on next steps and proposed work. KWD and Kirk have two proposals ready to go to EPA (resample historic sites and evaluate bulkhead efficiency). Doug Yager stresses educational need about natural effects of mineralized rocks on the watershed. Dave Susong (UTWSC) sums up discussion as the need for 1. immediate action to assist EPA and provide historic data, 2. conduct research on short term effects due to current spill, and 3. study long term effects of this spill and historic mining on watershed.

To move forward on developing a proposal/white paper, Horton (SWR) will request nominations from each center to a panel/committee to draft ideas.

Last item, next call scheduled for Tuesday, August 18<sup>th</sup> at 2:00pm.

Adjourn.

CWSC - Colorado Water Science Center  
UTWSC - Utah Water Science Center  
NMWSC - New Mexico Water Science Center

CGGSC - Crustal Geophysics and Geochemistry Science Center  
KWD - Katie Walton-Day  
CMR - Central Minerals Science Center

--

***Robert J. Horton, PhD.***  
*Science Coordinator - Geology*  
*U.S. Geological Survey, Southwest Regional Office*  
*Box 25046 Mail Stop 911*  
*Denver Federal Center*  
*Denver, CO 80225*

*Phone: 303.236.1338*  
*Fax: 303.236.5448*

--

*W. Ian Ridley, Ph.D*  
*Director, Central Mineral and Environmental Resources Science Center*  
*USGS, Denver Federal Center,*  
*Box 25046, MS 973*  
*Denver, CO 80225*  
*303-236-1800 or 5558*  
*[iridley@usgs.gov](mailto:iridley@usgs.gov)*